# Airborne InSAR - 1974

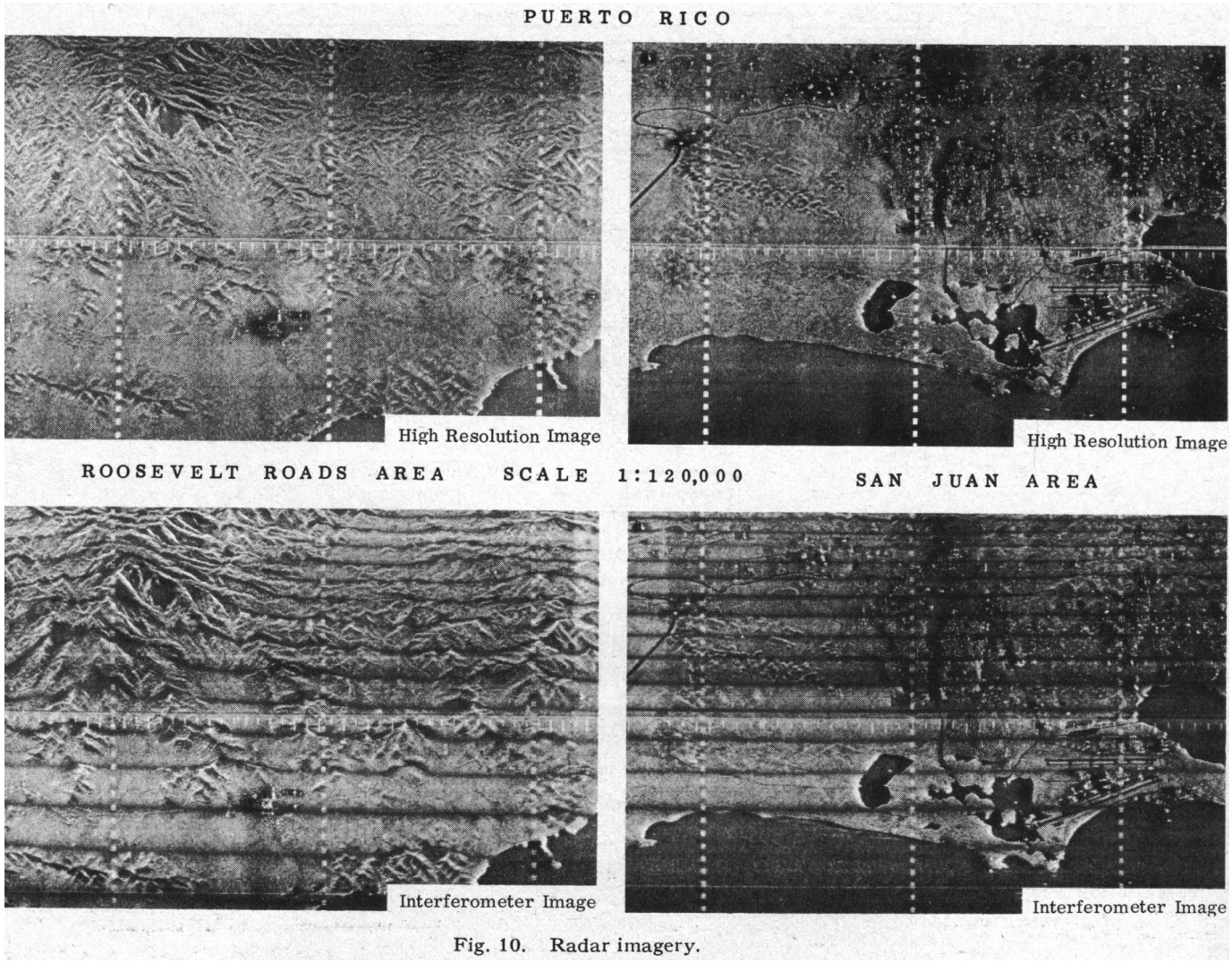



Fig. 10. Radar imagery.

From Graham, 1974

# Optical Radar Correlator

## Apollo Lunar Sounder Experiment

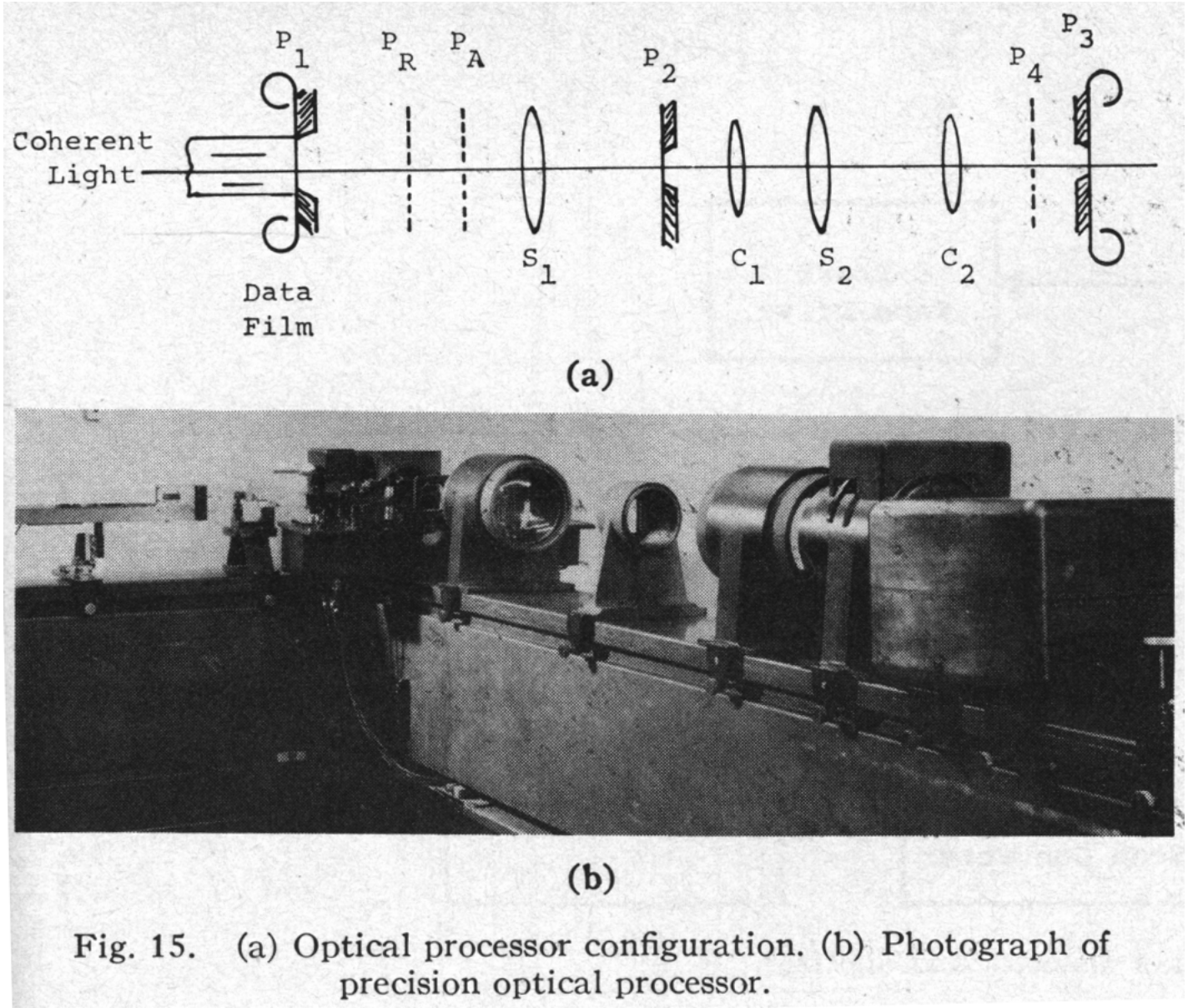
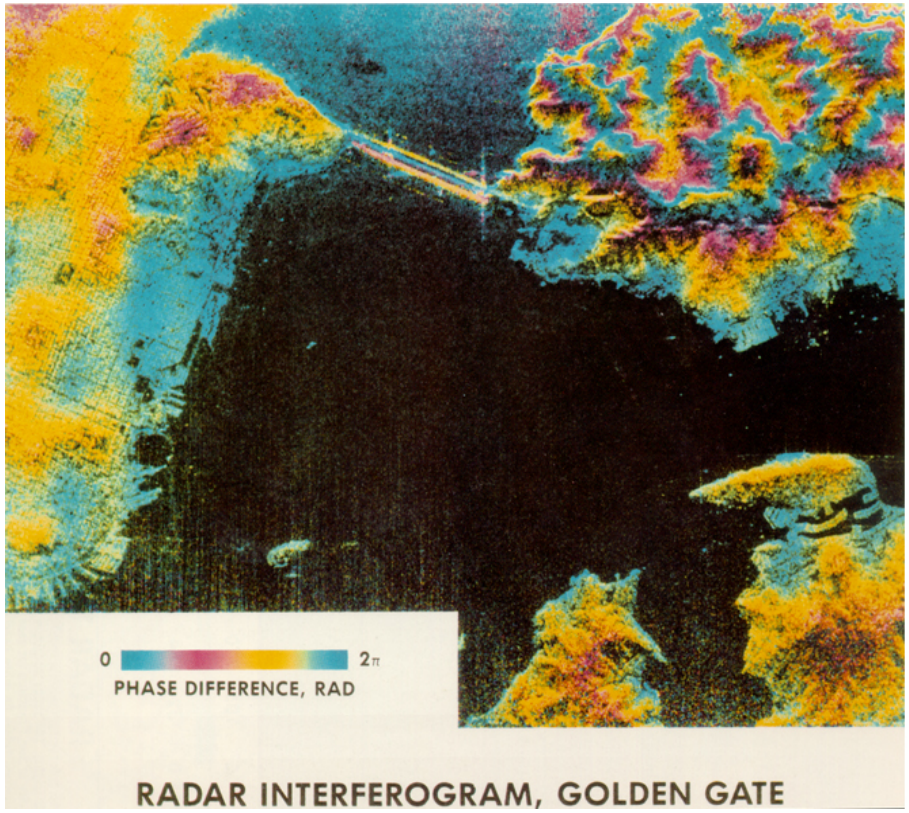
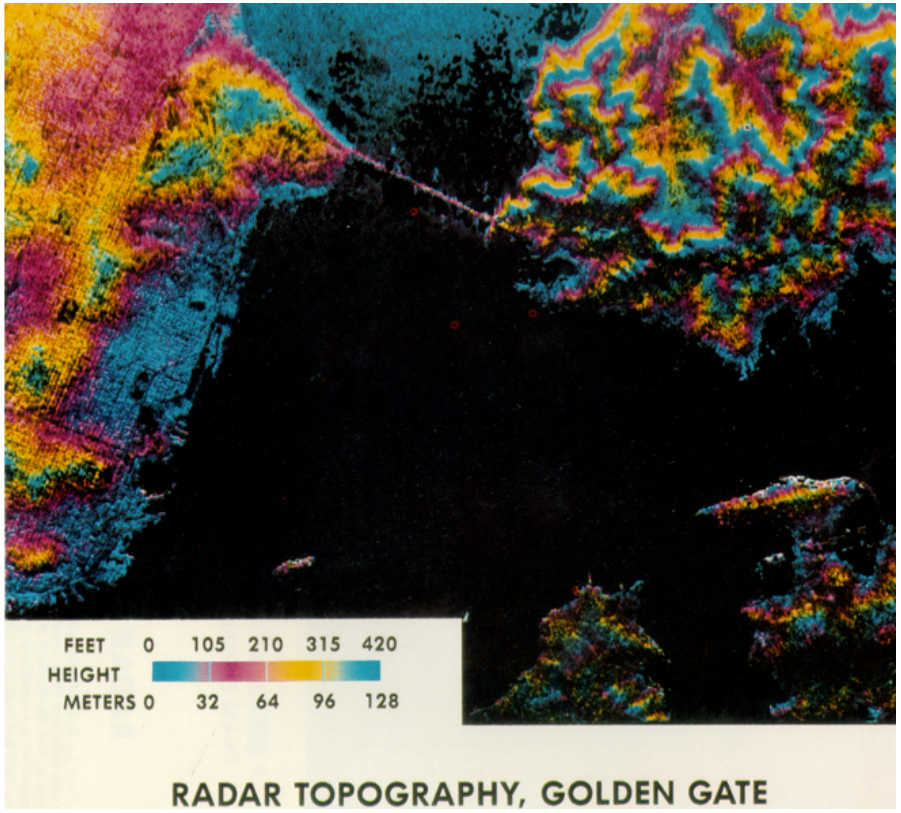



Fig. 15. (a) Optical processor configuration. (b) Photograph of precision optical processor.

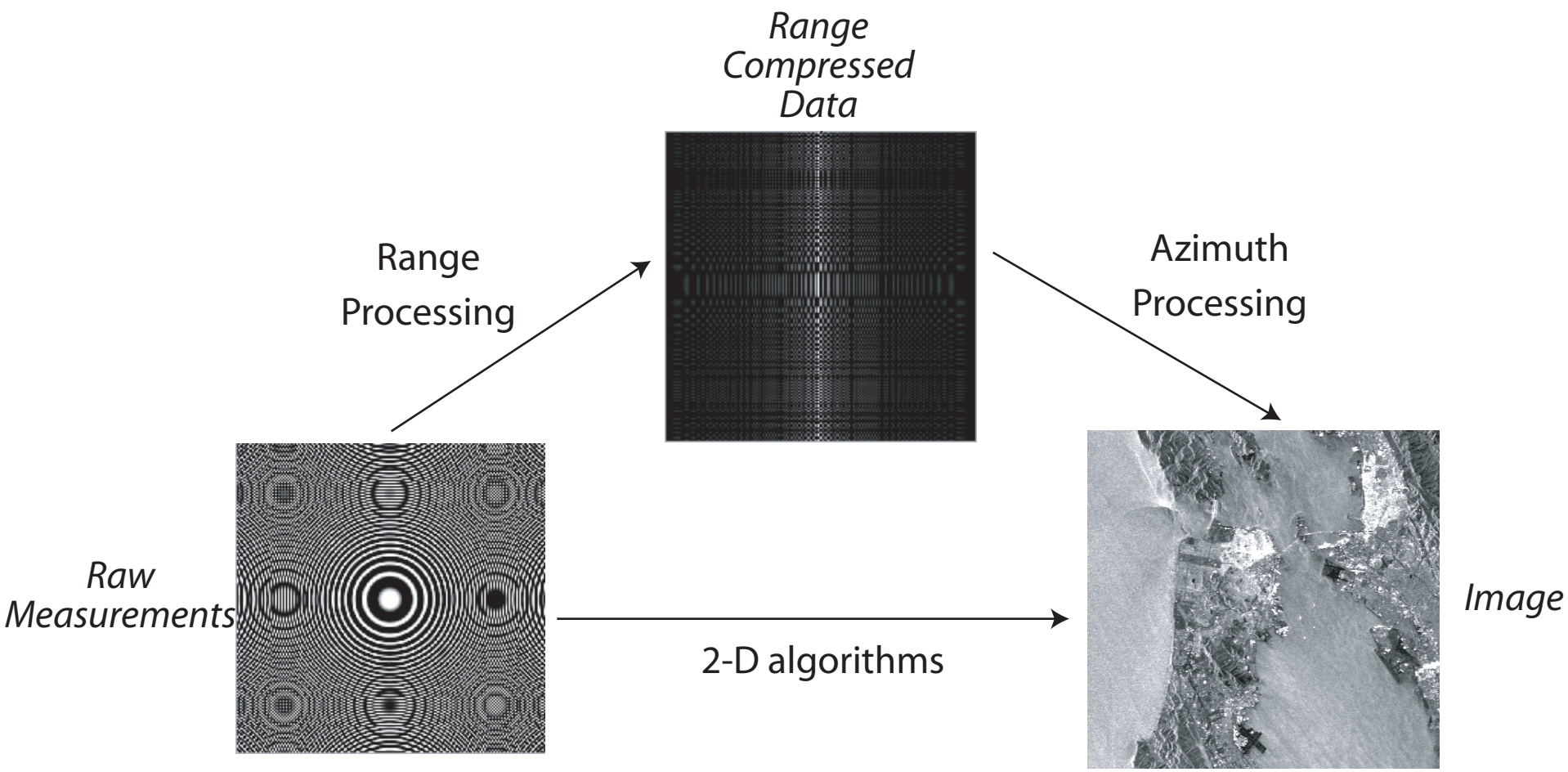
From Porcello et al., 1974

# Airborne systems for measuring topography (1986)

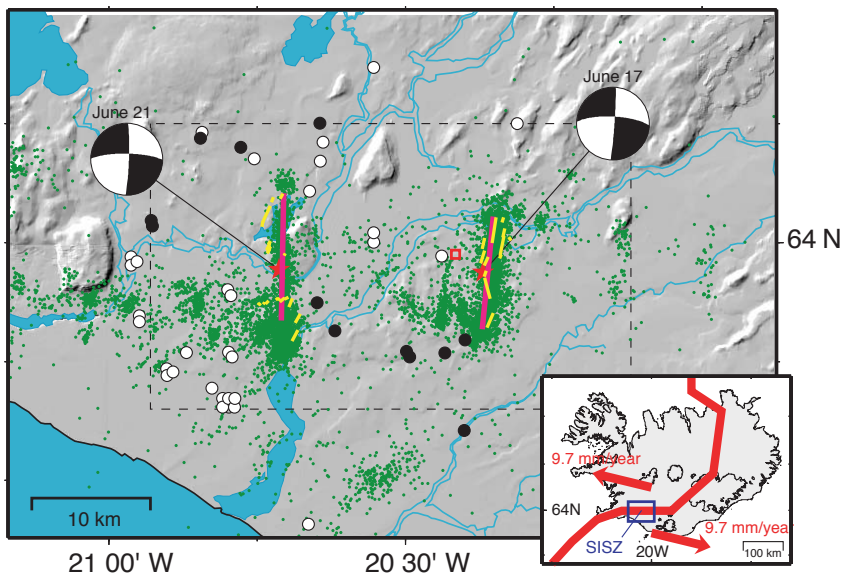


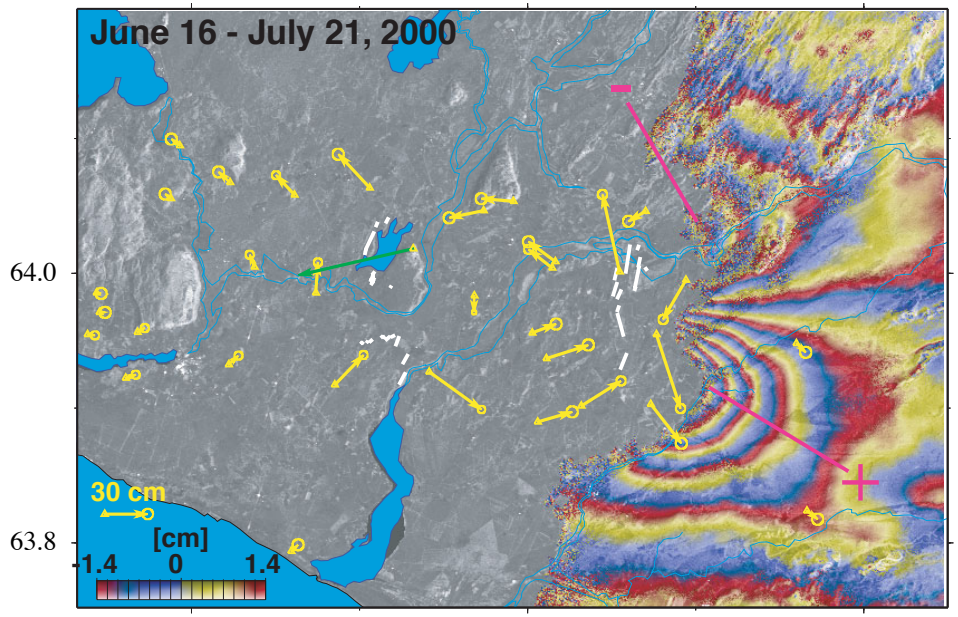



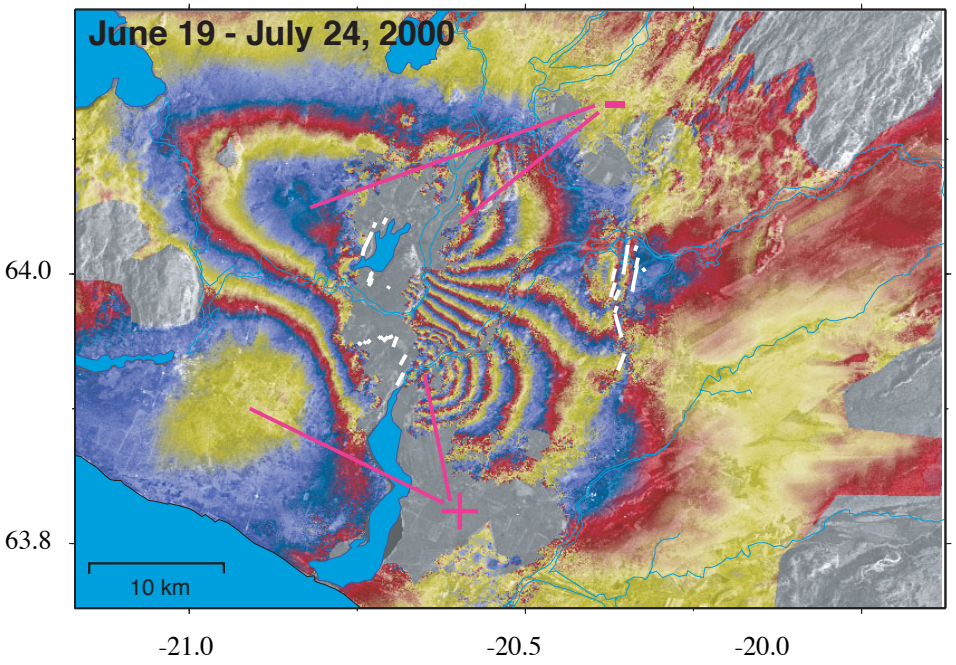
# SAR Processing Algorithms



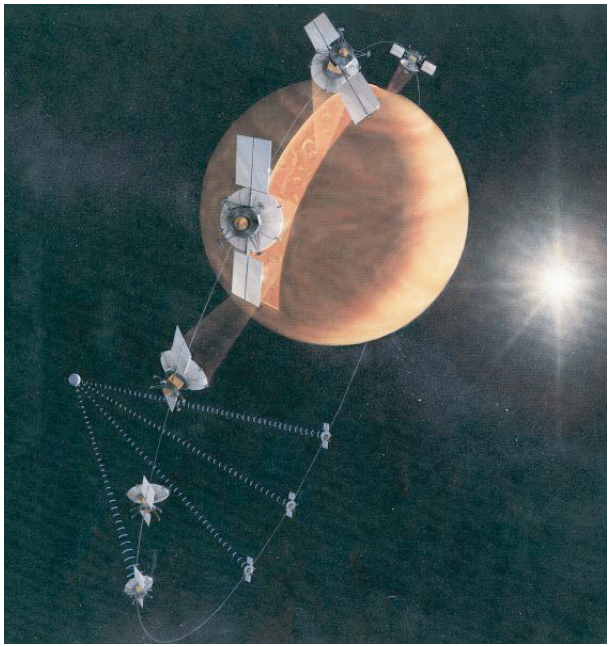

- Many algorithms: Range-Doppler, Wave Domain, Omega-K, Spotlight, Spectral Analysis, Chirp Scaling, Stolt Interpolation
- But it's all ***matched filtering***



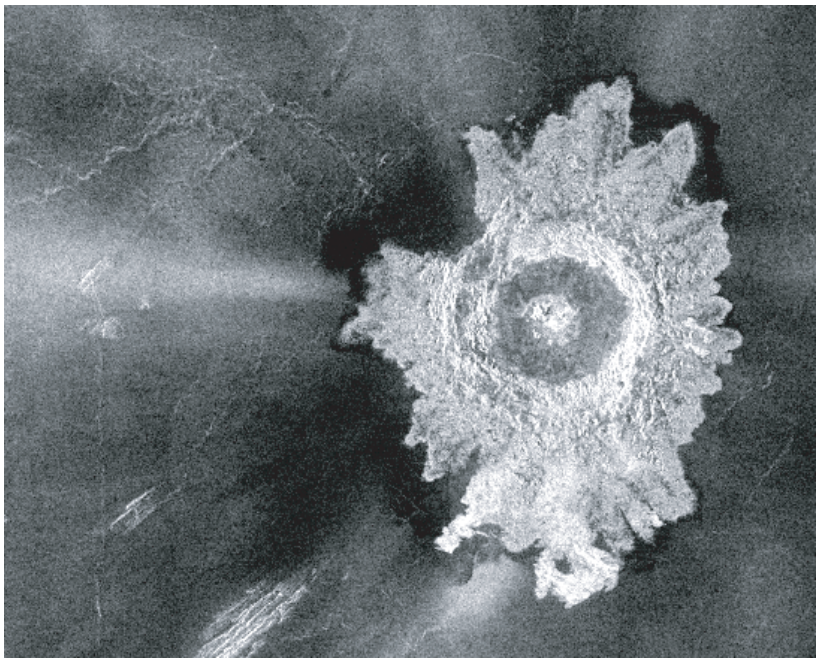



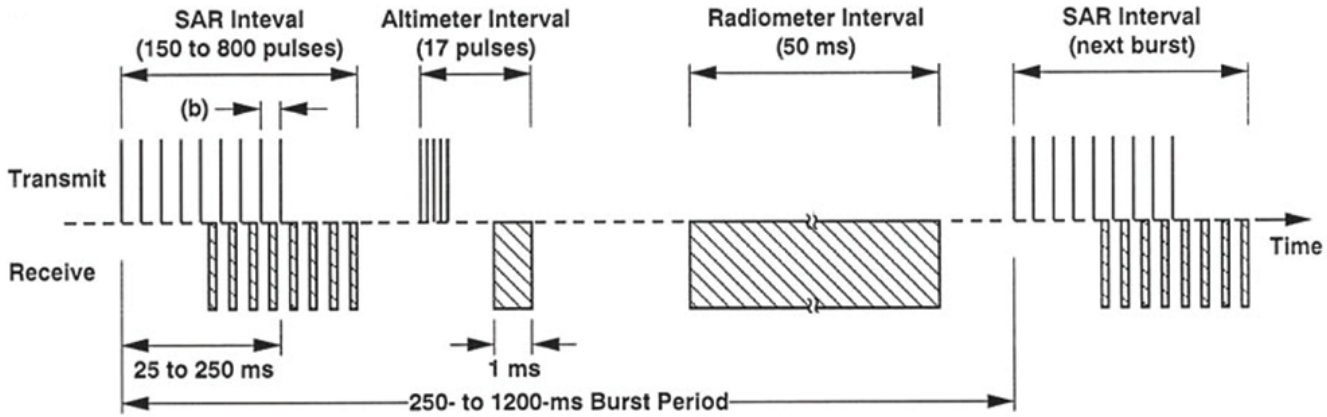

# COSEISMIC INTERFEROGRAMS AND GPS DISPLACEMENTS ICELAND EARTHQUAKES ON JUNE 17 AND 21, 2000



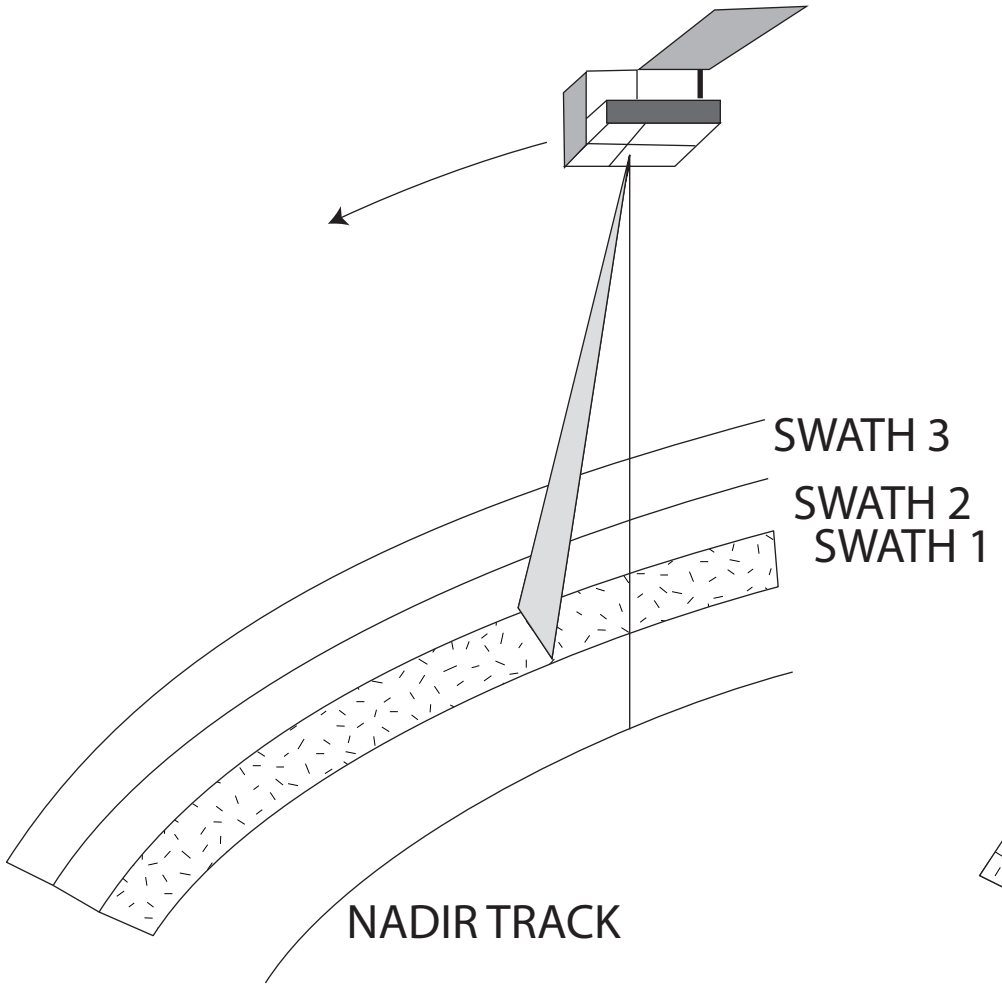
## Magellan Mission to Venus

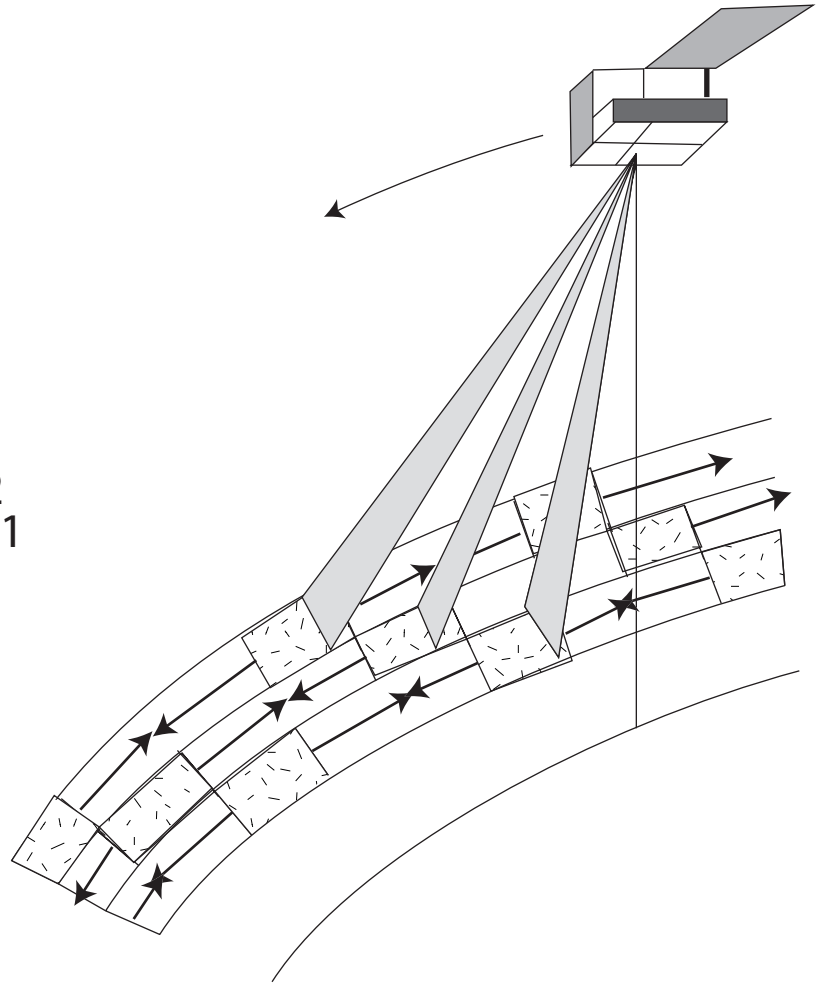


## Burst Mode Pulse Encoding



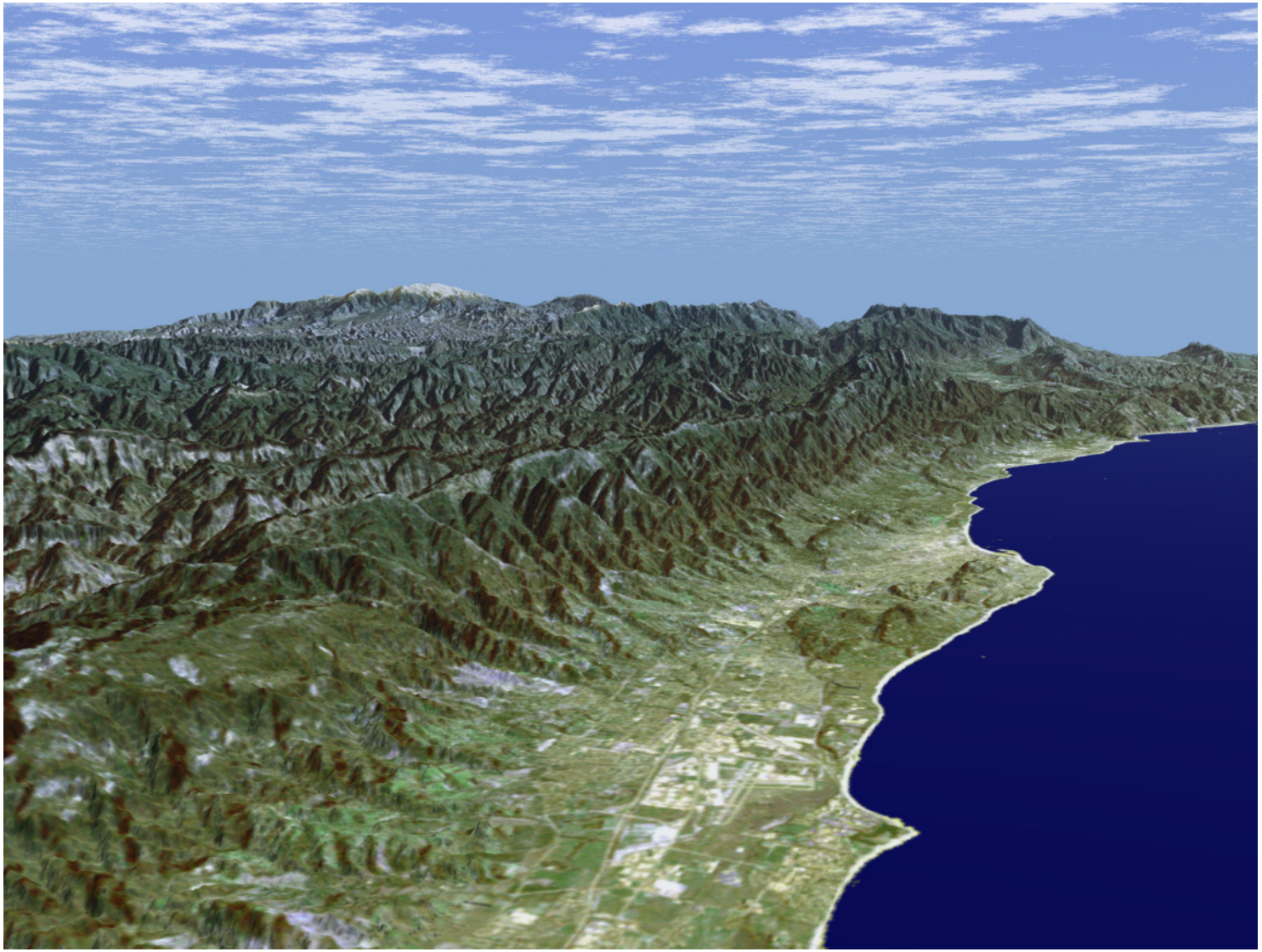
# ScanSAR Imaging Method and Geometry



SRTM Topography with Landsat Color

Santa Barbara, CA

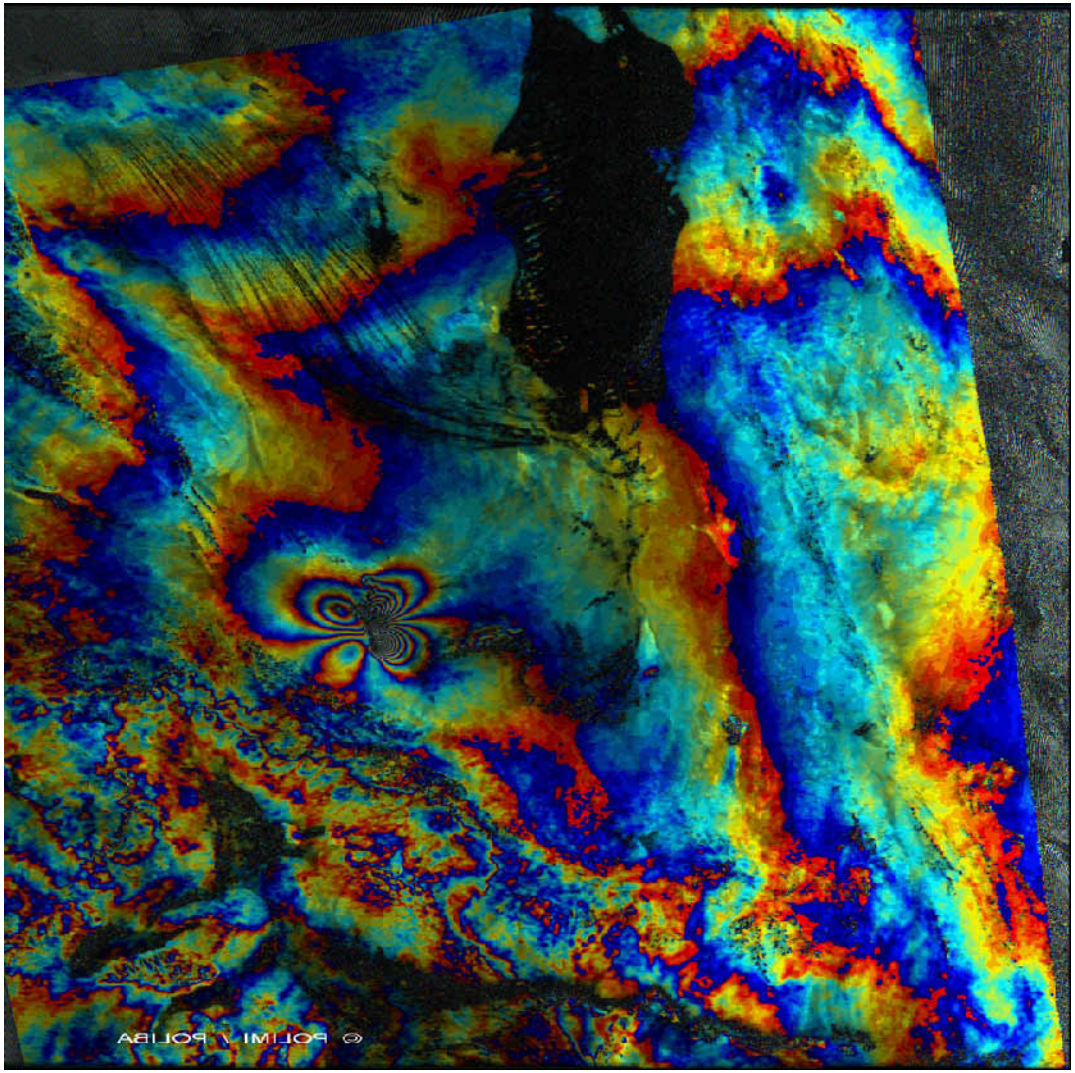


Bam Earthquake, Iran

Envisat Wide swath - Wide swath Interferogram

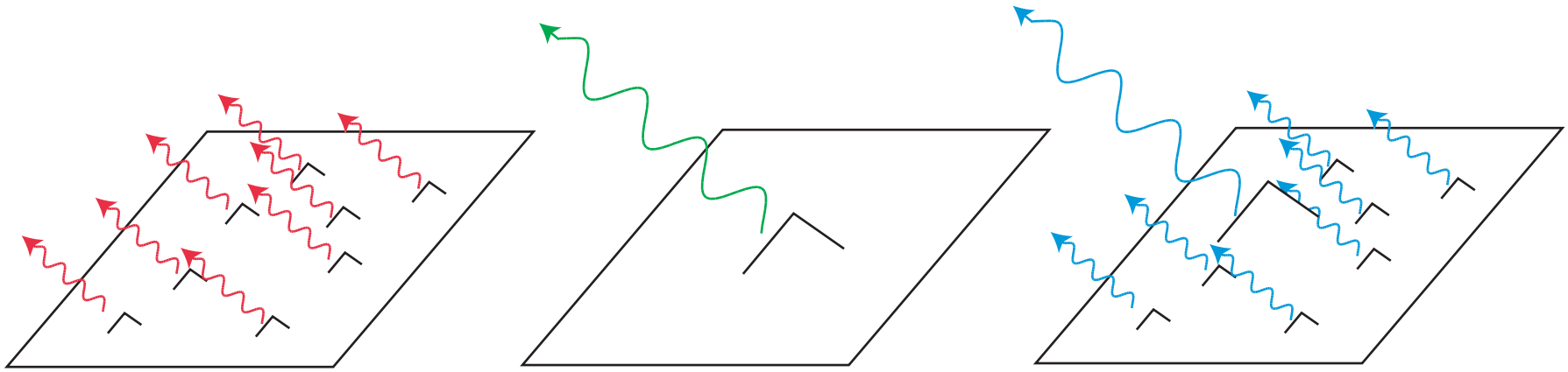
Baseline: 100 m
Burst overlap: 84%

(produced by polimi,
courtesy Andrea Monti-Guarneri)



~400 km

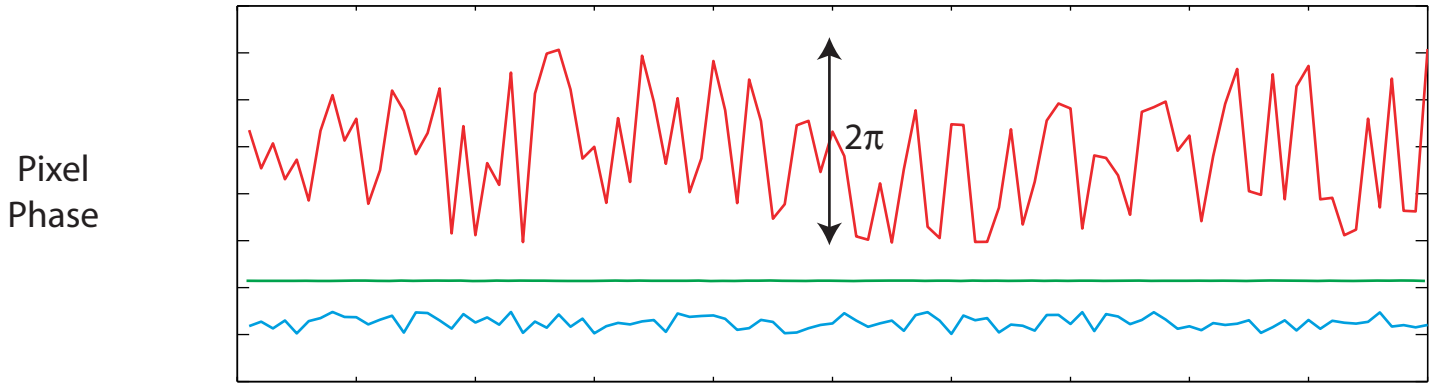
# Persistent Scatterers - Principle



Distributed Scattering Pixel

Single Scattering Center

Single, Dominant Scatterer

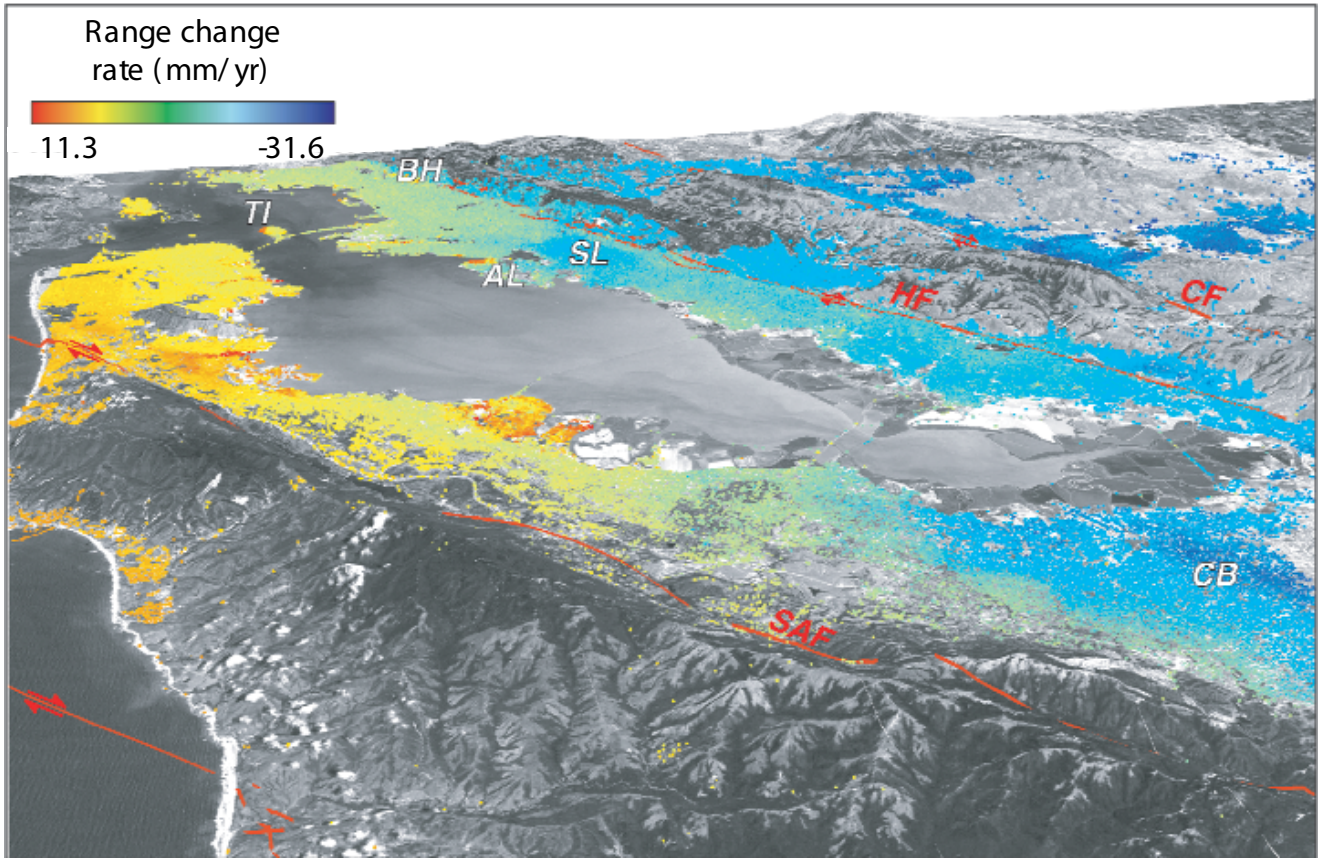



Pixel Phase

Time and Varying Baseline

# San Francisco Bay Area, CA

## 115,487 persistent scattering data points




From: Ferretti et al., EOS, 24 Aug 2004

Key:

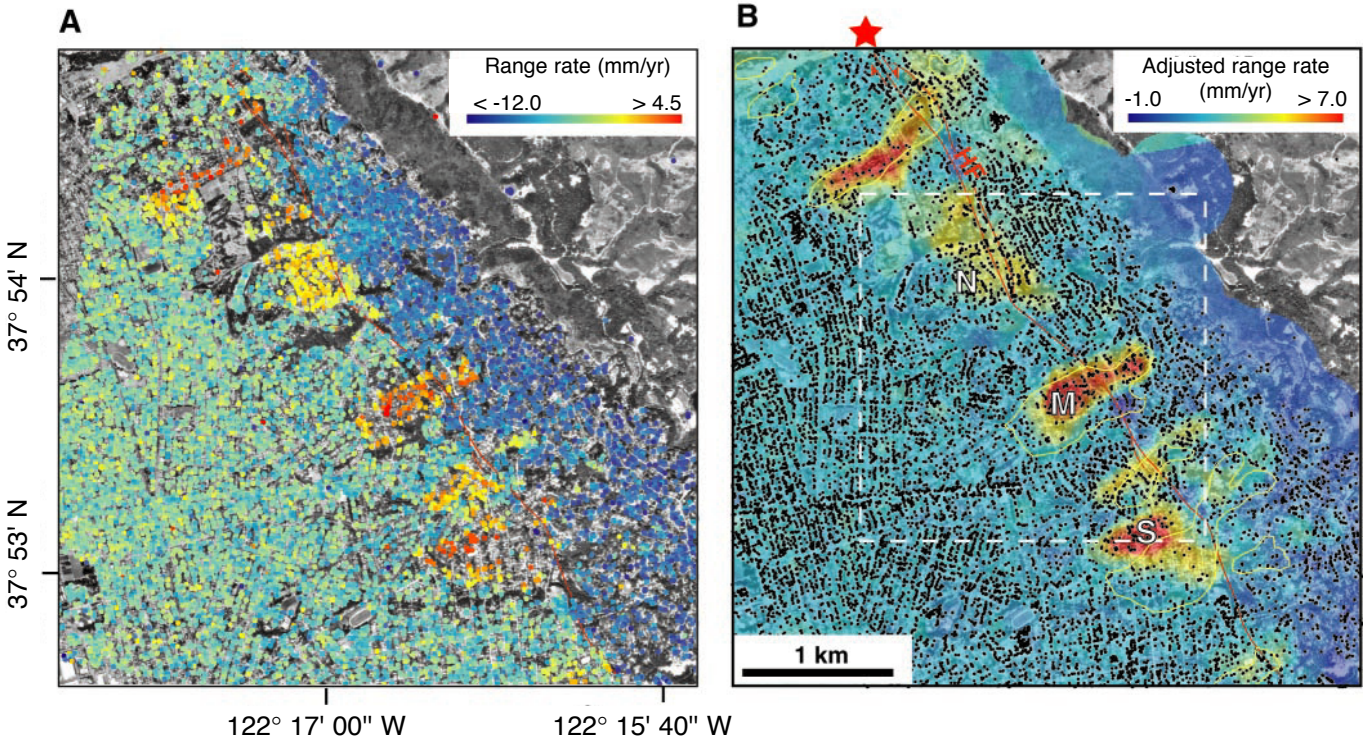
Data acquired 1992-2000

SAF, HF, CF: San Andreas, Hayward, and Calaveras faults

CB Cupertino Basin, SL San Leandro Basin, AL Alameda, TI Treasure Island, BH Berkeley Hills

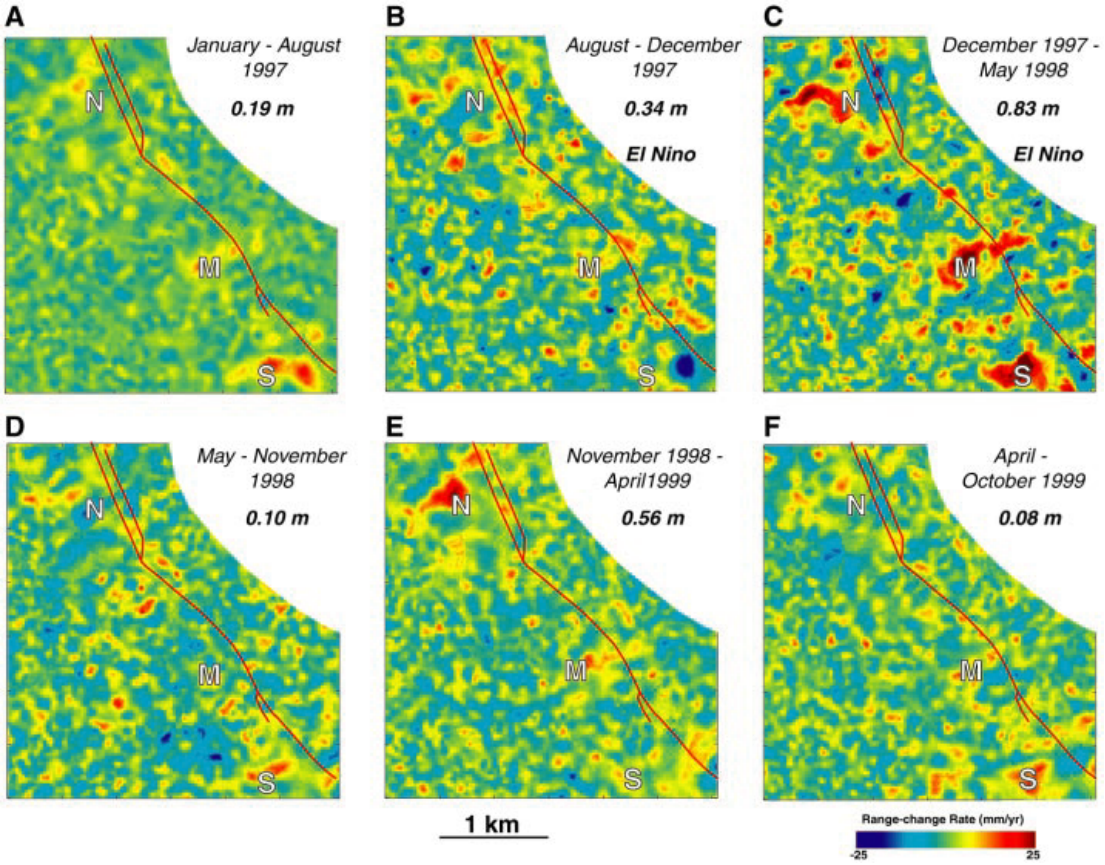
# Persistent Scatterer Landslide Detail

## Berkeley Hills, CA



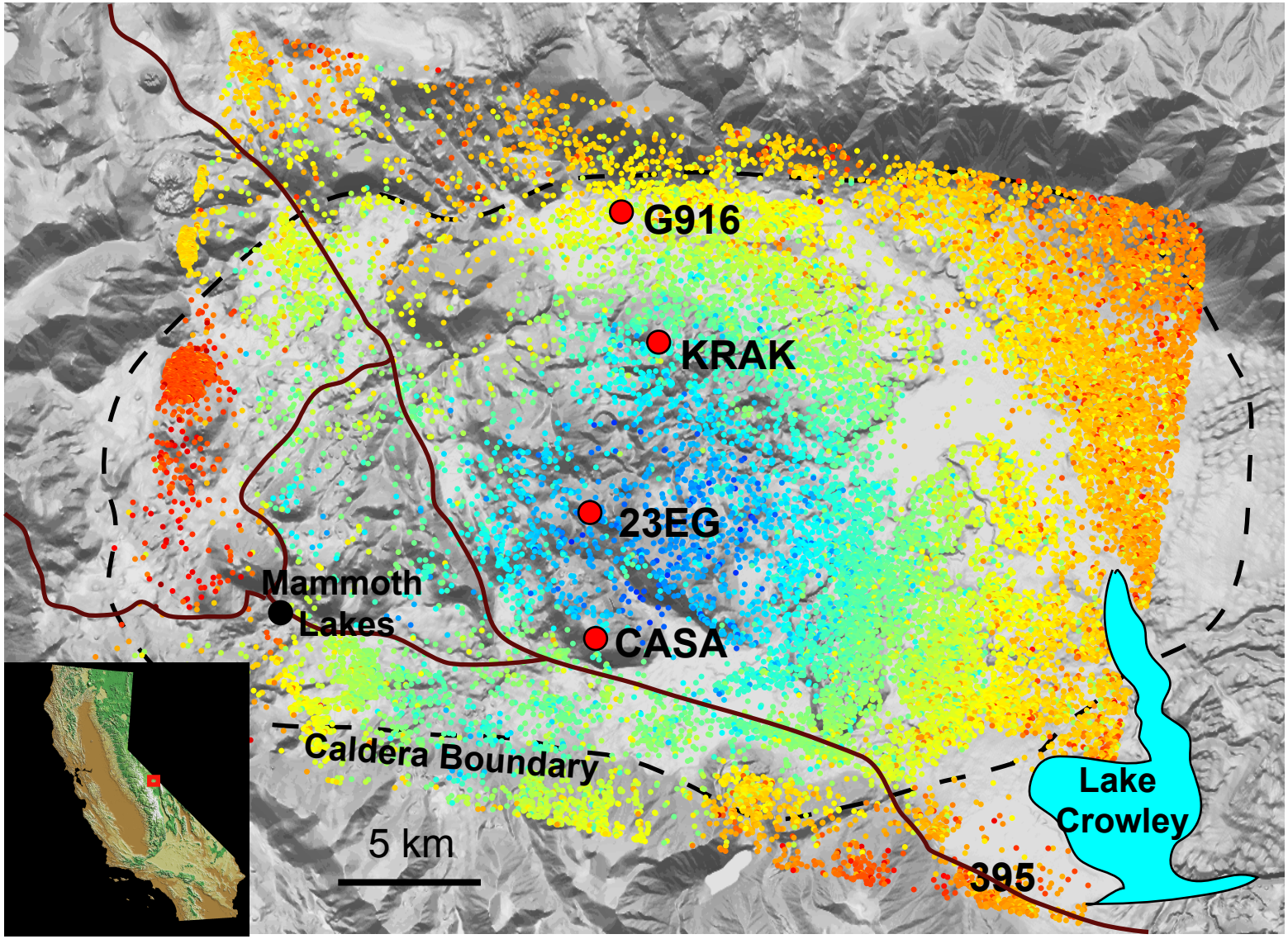

From: Hilley et al., Science, 25 Jun 2004

# Time / Rainfall Dependence of Landslide Area



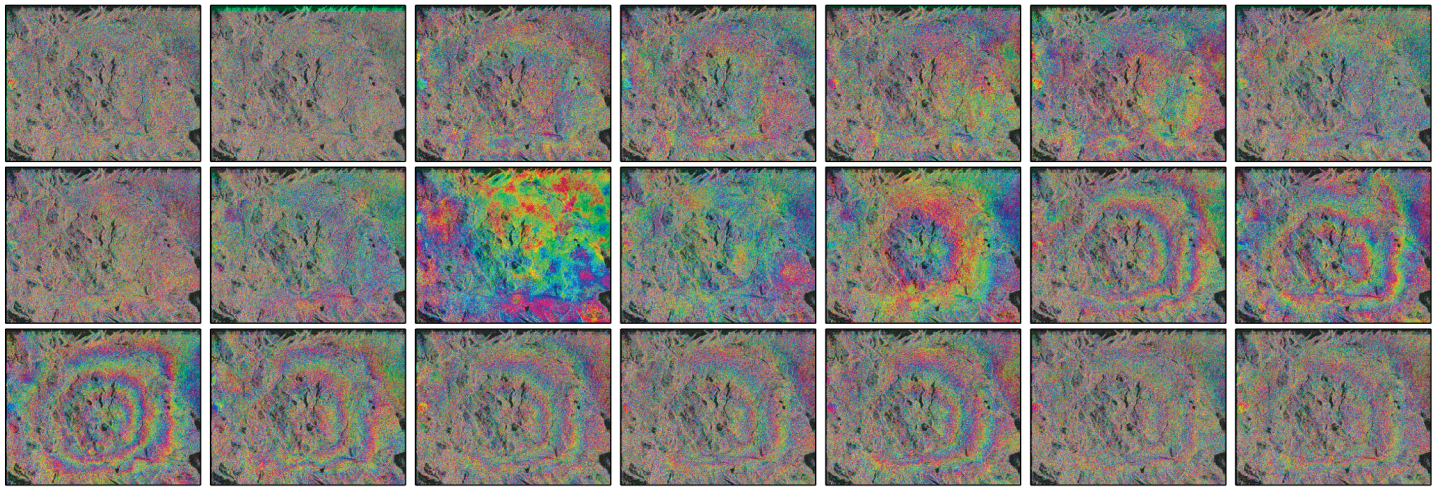

Hilley et al., Science, 2004

Long Valley Caldera Observed with Persistent Scatterers



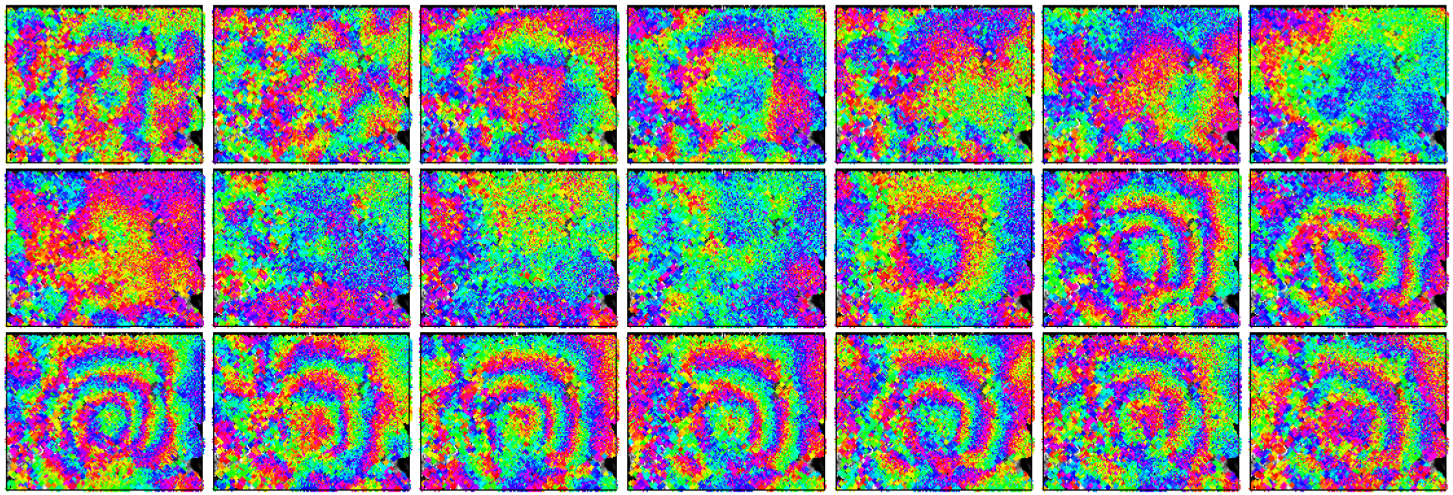
# Time series InSAR over Long Valley caldera

Sept. 1992



Interferograms

Aug. 2000

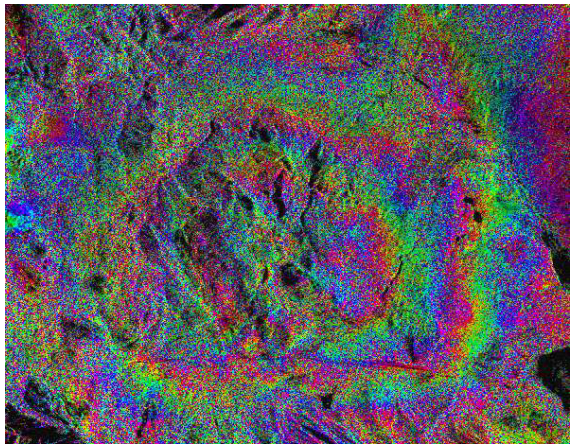


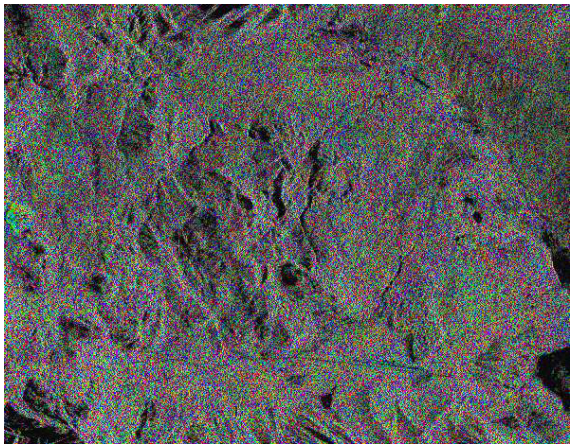
Persistent scatterers

"Good" quality interferogram

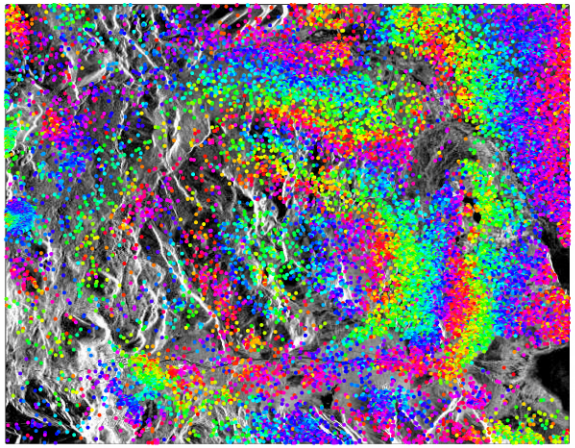
"Poor" quality interferogram

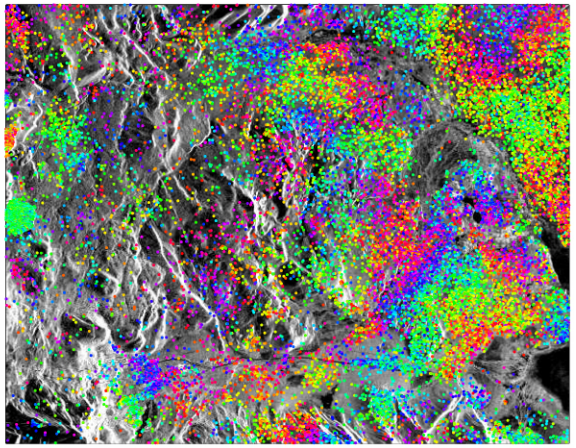
Interferogram





Persistent scatterers





# Long Valley Caldera Unwrapped Time Series and Inferred Vertical Deformation